

C L A I M S

1. A process of preparing glycolaldehyde which comprises reacting formaldehyde with hydrogen and carbon monoxide in the presence of a catalyst composition which is based on,

- 5       a) a source of rhodium, and  
      b) a ligand of general formula



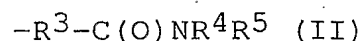
wherein  $R^1$  is a bivalent radical that together with the phosphorous atom to which it is attached is an optionally substituted 2-phospha-tricyclo[3.3.1.1{3,7}]-decyl group, wherein from 1 to 5 of the carbon atoms has been replaced by a heteroatom, and wherein  $R^2$  is a monovalent radical which is an optionally substituted hydrocarbyl group having from 1 to 40 carbon atoms.

15   2. A process as claimed in claim 1, wherein the catalyst composition further comprises c) a source of anions.

3. A process as claimed in claim 1 or claim 2, wherein bivalent radical  $R^1$  together with the phosphorous atom to which it is attached is a 2-phospha-1,3,5,7-tetralkyl-6,9,10-trioxa-tricyclo[3.3.1.1{3,7}]-decyl group.

20   4. A process as claimed in any one of claims 1 to 3, wherein monovalent radical  $R^2$  is an alkyl group having from 4 to 34 carbon atoms.

5. A process as claimed in any one of claims 1 to claim 3, wherein monovalent radical  $R^2$  is of general formula



wherein  $R^3$  is an alkylene group and  $R^4$  and  $R^5$  independently represent an alkyl, cycloalkyl, aryl or

alkaryl group, or R<sup>4</sup> and R<sup>5</sup> together represent a bivalent bridging group.

6. A process as claimed in any one of claims 1 to 5, wherein the source of formaldehyde is aqueous formaldehyde and the reaction is performed in a reaction medium comprising an aqueous phase and an organic phase, wherein the organic phase and aqueous phase are immiscible at 22 °C.

7. A process as claimed in claim 6, wherein the organic phase comprises a water-immiscible amide solvent.

8. A catalyst composition obtainable by combining a) a source of rhodium, b) a ligand of general formula



wherein R<sup>1</sup> is a bivalent radical that together with the phosphorous atom to which it is attached is an optionally substituted 2-phospha-tricyclo[3.3.1.1{3,7}]-decyl group, wherein from 1 to 5 of the carbon atoms has been replaced by a heteroatom, and wherein R<sup>2</sup> is a monovalent radical which is an optionally substituted alkyl group having from 10 to 40 carbon atoms, or monovalent radical R<sup>2</sup> is of general formula



wherein R<sup>3</sup> is an alkylene group and R<sup>4</sup> and R<sup>5</sup> independently represent an alkyl, cycloalkyl, aryl or alkaryl group, or R<sup>4</sup> and R<sup>5</sup> together represent a bivalent bridging group, and optionally c) a source of anions.

9. A catalyst composition as claimed in claim 8, wherein, in the ligand b), R<sup>2</sup> is of the general formula II.

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10. A process of preparing ethylene glycol which comprises preparing glycolaldehyde by a process as claimed in any one of claims 1 to 7, and then hydrogenating said glycolaldehyde.